

## PATENT SPECIFICATION

NO DRAWINGS

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## COMPLETE SPECIFICATION

## Improvements in or relating to Dietary Biscuits

We, SANDOZ PRODUCTS LIMITED, of Calverley, Lane, Horsforth, Leeds, a British Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to an edible composition containing a substance capable of swelling on ingestion in the form of a sandwich biscuit intended to replace wholly or partly the ordinary food consumed by humans desirous of losing weight; it is an improvement in or modification of the invention described and claimed in the cognate complete specification No. 1,041,600, filed on applications Nos: 49306/63 and 10894/64.

In said prior complete specification there is described and claimed a cream sandwich biscuit consisting of a conventional baked shell and a cream, said cream being a dispersion in a cream base of guar gum, minerals, vitamins and proteins.

We have now found that it is advantageous to incorporate the guar gum in the baked shell of the sandwich biscuit instead of in the cream base of the sandwich biscuit of said prior complete specification. As used herein the term "sandwich biscuit" designates any number of dry layers supporting any number of cream layers and includes the so-called open sandwich type of biscuit where a single layer of baked shell is provided with one layer of cream; this open sandwich may optionally be provided with a covering or coating of chocolate.

The use of cellulose derivatives as swelling agents in reducing said biscuits has previously been proposed. These cellulose derivatives, e.g. sodium carboxy-methyl cellulose and methyl cellulose, have the disadvantage of causing an unpleasant sensation in the mouth.

[Price 4s. 6d.]

It is a purpose of the present invention to reduce or overcome the above disadvantage, while at the same time providing cream sandwich biscuits containing vitamins, minerals, proteins and, optionally, any other solid substances necessary to sustain life. These materials should be present at a weight reducing level together with guar gum, i.e. a swelling agent which, on ingestion, gives a feeling of satiety, so that all or part of the ordinary food intake of humans desirous of losing weight may be replaced by the biscuits. The sandwich filling is, of course, not subjected to high temperatures at which the heat sensitive ingredients present in it would be adversely affected to an appreciable extent.

The present invention therefore provides a cream sandwich biscuit comprising (i) a baked shell incorporating guar gum but otherwise of conventional composition, and (ii) a cream layer, said cream being a dispersion in a cream base of minerals, vitamins and proteins.

In one form of it, the biscuit of the invention may be provided with a covering or coating of chocolate, e.g. a layer of baked shell supporting a layer of cream and the resulting open sandwich surrounded by a coating of chocolate. The chocolate covering or coating may have any desired composition (e.g. milk or plain chocolate as is usual in biscuit manufacture) and may be applied by conventional methods well known in biscuit manufacture, though temperatures at which the heat sensitive ingredients are adversely affected should be avoided.

The weight of guar gum to be incorporated in the biscuit shell must be adjusted in such a way that the gum content does not become too high which would cause an unpleasant sensation in the stomach after eating, but the amount of gum must be sufficient to give a reasonable feeling of satiety in the stomach,

Evidently the amount of gum will thus depend on the number of biscuits intended to make up a full day's diet and, assuming that 12 biscuits will give the desired weight reducing diet per day, the amount of guar gum in these 12 biscuits should amount from 0.5 g to 8 g, preferably 0.9 to 2.5 g. In Example 1 given hereinafter 1 g of guar gum is incorporated per 12 biscuits which are intended to be one day's diet. Should the number of biscuits making up the daily diet be other than 12, the limit of gum in the total number of biscuits will still vary within the said range, but the amount in each biscuit will have to be adjusted correspondingly.

It is within the scope of the present invention to provide in the biscuits, be it shell or cream, any one or more other materials than those specified above, which materials are desirable foodstuffs or other edible substances, e.g. sugar, starch or flavouring.

The cream base, i.e. matrix, of the cream sandwich filling is preferably a fat, for example a vegetable shortening (e.g. coconut oil or palm kernel oil) or a marine oil or a blend of these. The fat or blend of fats is chosen in such a way as to produce the required melting point of the cream.

It will be appreciated that the amounts of all the constituents in the filling and the calorific value of the shell will depend upon the number of biscuits which it is intended should replace one meal of a human being on a reducing diet. For example, when a total of four biscuits is intended to replace one meal, a suitable calorific value for the four biscuits would be about 340 calories. Furthermore, the amounts of vitamins, minerals, proteins and any other foodstuffs present must be such as to give a balanced diet and these amounts are well known.

In order to vary the diet, various flavourings of natural or synthetic origin may be incorporated in the cream, e.g. natural or artificial cheese, vanilla flavour, fruit flavouring (specific examples are lemon, lime and orange), peppermint, cocoa powder or cocoa butter chocolate.

In manufacturing the biscuits of the present invention the guar gum is incorporated in the dough used to produce shells for a conventional cream sandwich biscuit. The dough formula used for the biscuit shell may be that required for any conventional biscuit and experiments have shown that the guar gum in the limits within which it is incorporated in the biscuit shell as specified in the Examples does not affect the manufacture thereof.

The following Examples illustrate the invention without limiting it. The guar gum referred to in said Examples has a gum content of 77 to 85% by weight.

#### EXAMPLE 1

Sufficient guar gum is added to amount to

1 g per 145 g of finished biscuit shells and the calorific value is 27 calories per biscuit shell. The shells are made using the following ingredients in the amounts stated:—

ingredient	parts by weight	
biscuit flour	52.3	70
wholemeal flour	17.7	
soya flour	7.2	
margarine	7.2	
vegetable shortening	7.2	75
palm kernel oil	14.4	
granulated sugar	32.2	
syrup	2.5	
skimmed milk powder	1.2	
sodium chloride	1.0	80
guar gum	1.0	
sodium bicarbonate	0.7	
butter flavour	0.3	

The above ingredients are mixed and kneaded in conventional kneading equipment of known design. Moisture is added to obtain the required consistency and the dough is passed to conventional rolling equipment where the biscuit shapes are formed from the dough and then baked by a conventional technique, the finished weight of each shell being about 6.0 g.

For every 25.0 g of deodorized coconut oil the following ingredients:—

soya flour	13.0	g	95
calcium caseinate	4.25	g	
calcium phosphate dibasic	3.3	g	
magnesium phosphate dibasic	1.7	g	
copper and iron salts	0.052	g	
vitamin A	6000	i.u.	100
vitamin B <sub>1</sub>	2.0	mg	
vitamin B <sub>2</sub>	2.0	mg	
nicotinamide	18.0	mg	
vitamin B <sub>6</sub>	2.2	mg	
vitamin C	100.0	mg	105
vitamin D	1000	i.u.	
potassium iodide	0.0002	g	
vanilla flavour	0.150	g	
icing sugar	15.0	g	

are dispersed in said deodorized coconut oil by means of a grid-type mixer until a homogeneous cream results. The weight of cream used for each biscuit is the total resulting by mixing 25 g of said oil with the other above ingredients in the above amounts. This cream is placed in known manner between two shells to form a sandwich biscuit. The cream is applied by means of a cream stencilling machine of known design in a conventional manner and the entire cream sandwich is made in manner known *per se*.

The calorific value of the cream filling indicated in this example is about 30 calories.

#### EXAMPLE 2

The procedure adopted for making the shells is as described in Example 1. The ingredients

- used are the same except that the 0.3 parts by weight of butter flavour are omitted. A cream is then made up in the same way as described in Example 1, the ingredients used being the same except that the 0.15 g of vanilla flavour is replaced with 0.41 g of Jaffa orange flavour. The biscuit is made as described in Example 1 and the calorific value of shell and filling is also the same.
- Although in the above two Examples a wholemeal biscuit has been described for the outer shell, it is within the scope of the present invention to use any other conventional biscuit shell in which there has been incorporated guar gum.

## EXAMPLE 3

- Sufficient guar gum is added to amount to 1.1 g per 144.8 g of finished biscuit shell and the calorific value is 28 calories per biscuit shell. The shells are made using the following ingredients in the amounts stated:—

	ingredient	parts by weight
	white flour	55.9
25	wholemeal flour	18.3
	soya flour	7.7
	palm kernel oil	15.0
	vegetable shortening	7.7
	vegetable margarine	7.7
30	granulated sugar	24.3
	malt extract	1.4
	cocoa powder	1.4
	milk powder	1.4
	salt	0.8
35	soda	0.7
	chocolate colouring	1.4
	guar gum	1.1

- The above ingredients are mixed and kneaded in conventional kneading equipment of known design. Moisture is added to obtain the required consistency and the dough is passed to conventional rolling equipment where the biscuit shapes are formed from the dough and then baked by a conventional technique. The finished weight of each shell is approximately 6.0 g.

For every 25.0 g of deodorized coconut oil the following ingredients:—

	soya flour	13.0	g
50	calcium caseinate	4.25	g
	calcium phosphate dibasic	3.3	g
	magnesium phosphate dibasic	1.7	g
	copper and iron salt	0.052	g
	vitamin A	6000	i.u.
55	vitamin B <sub>1</sub>	2.0	mg
	vitamin B <sub>2</sub>	2.0	mg
	nicotinamide	18.0	mg
	vitamin B <sub>6</sub>	2.2	mg
	vitamin C	100.0	mg
60	vitamin D	1000	i.u.
	potassium iodide	0.0002	g
	lime flavour	0.2	g
	icing sugar	15.0	g

are dispersed in said deodorized coconut oil by means of a grid-type mixer until a homogeneous cream results. The weight of cream used for each biscuit is the total resulting by mixing 25 g of said oil with the other above ingredients in the above amounts; this cream is placed in known manner between two shells to form a sandwich biscuit. The cream is applied by means of a cream stencilling machine of known design in conventional manner and the entire cream sandwich is made in manner known *per se*.

The calorific value of the cream filling indicated in this Example is about 30 calories.

## EXAMPLE 4

- The procedure of making the biscuits is as in Example 3, but the 0.2 g of lime flavour is replaced by 0.06 g of oil of peppermint.

## EXAMPLE 5

- Sufficient guar gum is added to amount to 1.2 g per 59.09 g of finished biscuit shell and the calorific value is 23 calories per biscuit shell. The shells are made using the following ingredients in the amounts stated:—

	ingredient	parts by weight
	white flour	84.0
	sugar	21.0
	vegetable shortening	28.2
	dried milk powder	1.2
	cream of tartar	3.0
	sodium bicarbonate	3.0
	salt	6.0
	guar gum	25.75
	ammonium bicarbonate	2.25

- The above ingredients are mixed and kneaded in conventional kneading equipment of known design. Moisture is added to obtain the required consistency and the dough is passed to conventional cutting equipment where the biscuit shapes are formed from the dough and then baked by a conventional technique. The finished weight of each shell is approximately 4.9 g.

For every 24.2 g of vegetable shortening the following ingredients:—

	calcium caseinate	11.0	g
	calcium phosphate dibasic	2.3	g
	copper and iron salts	0.052	g
	saccharin sodium	0.025	g
	icing sugar	7.500	g
	potassium iodide	0.0002	g
	vitamin B <sub>1</sub>	2.0	mg
	vitamin B <sub>2</sub>	2.5	mg
	nicotinamide	18.0	mg
	vitamin B <sub>6</sub>	2.2	mg
	vitamin C	100.0	mg
	vitamin D	1000	i.u.
	vitamin A	6000	i.u.
	vanilla flavour	0.250	g

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are dispersed in said vegetable shortening by means of a 'Z' blade mixer until a homogeneous cream results. The appropriate weight of cream used for each biscuit is the total  
5 resulting by mixing 24.2 g of said shortening with the other above ingredients in the above amounts; this cream is placed in known manner on the upper surface of a biscuit shell.  
10 The cream is applied by means of a cream stencilling machine of conventional design in known manner. Each biscuit is then enrobed with a thin layer of milk chocolate in known manner. The calorific value of the cream filling indicated in this Example is about 25  
15 calories and of the chocolate coating 37 calories.

It will be seen from the above Examples, since 2 biscuit shells are used for each biscuit of Examples 1 to 4 and only one shell of  
20 Example 5, that the total calorific value of 4 biscuits is about 340 calories. Thus one meal could consist of about 4 biscuits in all, the choice of biscuits being left to individual taste. A two-course meal (savory course and sweet  
25 course) can be simulated by suitably choosing from the exemplified biscuits. In order to increase the intake of the amount of foodstuffs essential to maintain life (especially proteins and vitamins) to a reasonable weight reducing  
30 level it is suggested that a daily diet of, say, 12 biscuits should be supplemented by drinking about one pint of ordinary milk. Of course, other liquids devoid of any calorific value can also be taken so as to allow the swelling of  
35 the guar gum and thus increase the feeling of satiety.

#### WHAT WE CLAIM IS:—

1. A cream sandwich biscuit comprising (i) a baked shell incorporating guar gum but otherwise of conventional composition and (ii) a cream layer, said cream being a dispersion in a cream base of minerals, vitamins and proteins. 40
2. A biscuit according to Claim 1, in which the biscuit is provided with a chocolate coating or covering. 45
3. A biscuit according to Claim 1 or 2, in which the cream base is a vegetable shortening, marine oil or a blend thereof.
4. A biscuit according to Claims 1, 2 or 3, in which there is present, either in the cream or in the shell, one or more edible substances in addition to those specified. 50
5. A biscuit according to any one of Claims 1 to 4 in which the amount of guar gum in the baked shell is such as to provide 0.5 to 8 g in the total number of biscuits intended to make up a full day's reducing diet for a human being. 55
6. A biscuit according to Claim 5, in which the said guar gum range is 0.9 to 2.5 g. 60
7. A biscuit substantially as herein described with reference to any one of the Examples.

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